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finely villous, 6 to 7 mm. long: corolla 7 mm. long, puberulent, the teeth ovate. — Pochutla, Oaxaca, *Liebmann*, no. 250 (type in herb. Bot. Gard. Copenhagen; fragment and good sketch in herb. Gray).

b. Stem and floral branches glabrous.

13. *N. Palmeri*. Slender-stemmed shrub, with terete divaricate glabrous branches; internodes long, in dried state finely ribbed: leaves ovate, acute, scabrous both above and beneath with enlarged and indurated bases of trichomes (in the manner of many *Borraginaceae*), nearly or quite entire, 1.5 to 2.5 cm. long, abruptly narrowed at the base to a very short petiole: floral branches opposite; peduncles slender, 2 to 4 cm. long; glomerules 2.5 cm. in diameter, subglobose, about 25-headed; subtending bracts ovate-oblong to narrowly oblong, 6 to 8 mm. in length, their pubescence similar to that of the leaves; involucre terete, 10-nerved, 1 cm. long, sparingly villous; segments deltoid-lanceolate, minutely ciliated: corolla 1 cm. long, essentially glabrous; its teeth elliptic-oblong, 3 mm. in length, 2-nerved: pappus a finely fringed campanulate cup. — Collected by Dr. Edward Palmer, at Colima, Mexico, 27 to 28 February, 1891, no. 1320.

+ + Annual: tropics of both hemispheres.

14. *N. mollis*, Jacq. Frag. 58, t. 85 (1809). *Lagasca mollis*, Cav. Ann. Cien. Nat. vi. 333, t. 44 (1803). *Noccaea mollis*, Cass. l. c. 103 (1822). *Lagascea Kunthiana campestris*, Gard. in Hook. Lond. Journ. Bot. v. 238 (1846). *Lagasca parvifolia*, Klatt, Ann. k. k. Nat. Hofmus. Wien, ix. 360 (1894). — Western and southern Mexico, tropical South America, West Indies, also Bengal, etc.

III. — NEW SPECIES AND NEWLY NOTED SYNONYMY AMONG THE SPERMATOPHYTES OF MEXICO AND CENTRAL AMERICA.

Dioscorea platycolpota, E. B. Uline in litt. "Glabrous throughout; stem stout, dextrorsely twisted; leaves membranaceous, orbicular-cordate, 9 to 11-nerved; ♂ racemes short, solitary, densely flower-bearing nearly to the base; flowers pedicellate, disposed in 3 to 5-flowered cymules, which in turn are closely arranged on the pendant rachis; perianth greenish yellow, campanulate, equalling or surpassing the slender pedicel; stamens three, rising divaricately from the somewhat fleshy receptacle, a little shorter than the ovate segments of the perianth; anthers extrorse. Pistillate spikes short, solitary; perianth very shortly stipitate; style

column slender, its slender, divaricate branches bifurcate at the apex; capsules small and crowded, obovate, leathery in texture; seed small, corrugated, with peripheral wing. — Collected by C. G. Pringle on limestone mountains near Iguala, State of Guerrero, Mexico, altitude 1,230 m., 15 September, 1900, no. 9224. This plant exhibits close affinities for *D. Pringlei*, Rob., the essential floral characters being identical; but the striking difference displayed in its much larger and densely crowded flowers serves to give it an entirely distinct aspect, and seems to justify a specific description. Leaves 8 to 9 cm. in diameter. Racemes 12 cm. long, with rather stout rachis. Perianth 5 mm. wide; segments 4 mm. long. Capsules 7 to 8 mm. wide."

Calochortus Pringlei. Bulb ovoid, 3.5 cm. long, covered by more or less thickened somewhat reticulated fibres, and surmounted by a cylindrical mass of long linear fuscous scales, from the midst of which rises the stem; this 4 dm. high, terete, glabrous, simple or branched, 3-5-leaved: leaves flat, linear, attenuate, the basal 3 dm. long, the cauline gradually shorter; bracts of the spathe 2, opposite, subequal, 2 to 3 cm. long, lanceolate, acuminate; pedicels glabrous, 2 to 7 cm. long; flowers 3 cm. in diameter, dark purple or almost black; sepals narrowly obovate, bluntly pointed or retuse, glabrous except at a small roundish area a little below the middle on the inner surface: petals broadly obovate, cuneate, 1.4 cm. long, two-thirds as broad, obtusely pointed, externally glabrous, internally covered on all parts except the narrowed base by rather coarse violet or yellow hairs: filaments 5 lines long, glabrous; anthers 3.5 lines long, apiculate: ovary glabrous; capsule acute at each end, 2.5 cm. long, 8 mm. in diameter. — Collected by C. G. Pringle in thin soil of the top of knobs of the Sierra de Tepoxtlán, State of Morelos, Mexico, altitude 2,300 m., 15 September, 1900, no. 8435. Type in herb. Gray. Evidently related to *C. flavus*, Schultes, f. but differing in its dark colored flowers, short and broad fruit, etc.

MIMOSA ACANTHOCARPA, Benth., var. **desmanthocarpa**. Habit, foliage, and thorns of the typical form: pods unarmed, the valves minutely fulvous-tomentose. — Collected by E. W. Nelson between San Cristobal and Teopisca, Chiapas, Mexico, altitude 2,060 to 2,620 m., 4 December, 1895, no. 3428. Type in herb. U. S. Nat. Museum; fragment in herb. Gray.

Mimosa eurycarpoides. Branches glabrous, soft-woody, with rather large pith, terete or subangular, armed by a few small scattered spines: leaves large, (including the petiole) 1.2 to 2 dm. long; pinnae 7 to 12 pairs, 3.5 to 5 cm. long, puberulent upon the rachis; leaflets 20

to 30 pairs linear-oblong, 5 to 8 mm. long, 1.6 mm. wide, acutish, oblique at the base, finely appressed-pubescent upon both sides: flowers capitate, heads globose, 1.3 cm. in diameter; peduncles filiform, 1.5 cm. long, borne by twos and threes in the axils of the upper leaves: calyx turbinate-campanulate, scarious, slightly cuspidate-toothed, 0.8 mm. long: corolla 2.3 mm. long, glabrous, not conspicuously ribbed: stamens 8 or 10: pod 4.5 cm. long, 1.2 cm. broad, unarmed, glabrous, dark colored, oblanceolate, acute, thickish; valves not segmented. — Collected by Dr. J. N. Rose in the foothills of the Sierra Madre, near Colomas, State of Sinaloa, Mexico, 21 July, 1897, no. 1805. Type in herb. U. S. Nat. Museum; fragment in herb. Gray. To this species I should refer also Dr. Rose's no. 3157, collected on a road between Acaponeta and Rosario. While it is more copiously armed it shares all important characteristics with the plant from Colomas. The species is readily distinguished by its smooth unjointed fruit and axillary inflorescence.

Mimosa ionema. Shrub or small tree 3 to 5 m. high; branches unarmed, terete or nearly so, puberulent; branchlets green, angled and costate, tomentulose: stipules filiform, 8 mm. long, tomentulose under a lens; petioles angled, straight, puberulent-tomentulose, 4 to 6 cm. long, equalled by the foliar rachis; pinnae 4 to 6 subremote pairs, 5 cm. long, the lower ones commonly alternate; stipels 1 mm. long; leaflets about 15 pairs, oblong, obtuse, green and nearly or quite glabrous upon both surfaces, slightly paler beneath, oblique at the base, excentrically 1-nerved, pinnately veined, 1 cm. long, 3 to 4 mm. broad: flowers loosely spicate, spreading or somewhat deflexed; spikes fascicled by 3's and 4's in the axils of the upper leaves, ascending, 6 cm. long, on peduncles 2 to 3 cm. in length: corolla white or pale yellow, 2.5 mm. long, cleft to below the middle, without conspicuous nerves or ribs, glabrous; segments 4 to 5, lance-oblong, acutish: stamens 8 to 10; filaments violet-tinged: fruit (immature) narrowly oblong, acute at both ends, thin, glabrous, 5 cm. long, 7 mm. broad, about 8-seeded. — Collected by C. G. Pringle in the valley below Cuernavaca, Mexico, altitude 1,230 m., 17 October, 1900, no. 8377. Type in herb. Gray.

Mimosa Watsoni. Fruticose and probably scandent: stems subterete, tomentulose chiefly along six longitudinal lines, these bearing minute approximate subequal very short recurved spines: branchlets grayish-tomentose: petioles (including the rachis) 5 cm. long, rigid, angled, armed laterally and ventrally by 2 or 3 lines of recurved spines, tomentulose especially along the armed angles; pinnae 2 pairs; the lower bearing 1 or 2 pairs of leaflets, the upper with 2 or 3 pairs;

leaflets rhombic-ovate or obovate, lucid and finely pubescent above, tomentulose beneath, destitute of setae and ciliation, pinnately veined; the lateral 1.5 to 2.5 cm. long, subsymmetrical, the terminal twice as large, oblique and with excentric midnerve: globular heads (7 mm. in diameter) white, racemosely disposed on the long spreading unarmed grayish tomentose branches of a loose panicle; pedicels slender, 1 cm. long: corolla 4-parted to the middle, its lobes short-oblong, rounded at the apex: stamens 8: pods 5 cm. long, 7 to 10 mm. broad, glabrous and lucid upon the disarticulating valves but finely papillose under a strong lens, dark brown, unarmed except for a few scattered minute recurved spines upon the tomentulose replum; rectangular segments thin, broader than long. — Collected by the late Dr. Sereno Watson in the eastern portions of Vera Paz and Chiquimula, Guatemala, in 1885, nos. 323 in fruit and 185 in flower. Types in herb. Gray. This species of the subgenus *Habbasia* is closely related to the South American *M. Spruceana*, Benth. From this it differs, however, in the much less dense and less rufescent pubescence of the stem, more strongly armed petioles, less numerous leaflets of different venation and finally in its much smaller fruit, which is at full maturity less than half as broad as in the Brazilian plant.

Russelia Deamii. Stems becoming 1.6 m. long, 4-angled below, 6-angled toward the ends, copiously branched, glabrous except on the smaller branchlets, with slender ribs at the angles: leaves 1.5 to 2 cm. long, two thirds as wide, ovate, acute, incisely serrate except near the cuneate base, green, loosely pubescent and sparingly punctate above, slightly paler and strongly white-villous beneath especially about the larger nerves and near the base: cymes numerous, 3-flowered; peduncles slender, 4 mm. long, pubescent as are also the filiform slightly longer pedicels; bractlets linear: lobes of the villous calyx lance-acuminate from an ovate base: corolla scarlet, 1.6 to 2 cm. long, the nearly equal lobes suborbicular: fruit not seen. — Collected at Cuernavaca, Mexico, 7 July, 1900, by Charles C. Deam, no. 30. This species differs from *R. sarmentosa*, Jacq., in its villous more incisely toothed leaves and 6-angled branches, from *R. jaliscensis*, Rob., in the form of its calyxlobes, from *R. polyedra*, Zucc., in its larger flowers and glabrous less strongly ribbed stems as well as in the form and sharp dentation of the leaves.

Russelia trachypleura. Stems 6-angled; angles prominent, rib-like, pale, roughened by small scattered callosities; areas between the ribs flat, green, glabrous or (especially near the nodes) somewhat hairy; branches usually 4-angled: leaves ternate on the stem, opposite on the

branches, elliptic-ovate, acute or acutish at each end, short-petioled, sharply serrate, green, resinous-dotted, and pubescent on the upper surface, slightly paler and pubescent upon the pinnately arranged veins beneath: flowers in short few-flowered axillary cymes: calyx-lobes ovate, caudate-acuminate, externally pubescent toward the sharp tip, 4 mm. long: corolla bright scarlet, 1.2 cm. long, with cylindrical tube and 4 short rounded subequal lobes, the upper one broader and emarginate. — Collected by C. G. Pringle on the Sierra de Tepoxtlán, State of Morelos, Mexico, altitude 2,300 m., 11 September, 1900, no. 9445. Readily distinguished from all the other species by the callosities on the rib-like angles of its stems.

Piqueria pyramidalis. Stem terete, 2 to 2.5 m. high, puberulent, green but maculate with elongated dark brown or purplish dots: leaves alternate (at least the upper ones), petiolate, broadly ovate, shallowly about 7-lobed, coarsely crenate, 3-nerved from the rounded to strongly cordate base, green and scabrous-puberulent above, paler and tomentulose beneath, the larger 1.7 dm. long and about as broad; petioles subterete, tomentulose: small and very numerous heads in pedicellate racemose glomerules; these forming a large leafy-bracted pyramidal panicle: involucreal scales oblong, green, about 2-seriate, 2.5 to 3 mm. long, puberulent and covered with minute amber-colored particles upon the outer surface: corolla white, 3 mm. long, with short proper tube and relatively large throat, also bearing a few amber-colored particles: styles much exserted, clavate, purplish or brown; achenes dark-colored, glabrous, lucid, 2.5 mm. long. — Collected by C. G. Pringle in shade of cliffs on mountains above Iguala, altitude 1,230 m., 10 October, 1900, no. 8389. Type in herb. Gray. This species, although possessing all the technical characters of the genus, differs considerably in habit from the other Mexican species, being in fact nearer some of the South American.

Ageratum lucidum. Shrub with buff cortex and opposite spreading curved-ascending terete finely striate glandular-puberulent branches: leaves opposite, ovate, acutish, serrate from below the middle, thin, veiny, glabrous or early and completely glabrate upon both surfaces and lucid especially above, 4 cm. long, half as broad, ciliolate upon the margin, 3-nerved from somewhat above the abruptly acuminate shortly petiolate base, minutely white-dotted beneath and also covered with globular resinous or glandular atoms: corymbs long-peduncled (often irregularly compound), 2-6-headed and subtended by reduced opposite lance-oblong to linear sessile bracts; pedicels 1 to 2.4 cm. long, curved-ascending, 1-headed with or without 1 or more filiform bractlets; heads campanu-

late, 70–100-flowered, nearly 1 cm. in diameter; outer involucre scales linear-filiform, ciliated, the inner lance-oblong, acuminate, rigidulous, the subscarios margins erose: achenes black, 2 lines long, sharply angled, glabrous, very finely and transversely striate; pappus a shallow un-toothed cup without awns. — Collected by C. G. Pringle, on mossy sides of conglomerate knobs of the Sierra de Tepoxtlán, near Cuernavaca, State of Morelos, Mexico, altitude 2,310 m., 31 October, 1900, no. 8362, and previously 15 March, 1899, no. 7851. Well marked. Type in herb. Gray.

***Ageratum rhytidophyllum*.** Shrub with opposite terete dark red branches covered with a fine crisped cinereous puberulence: leaves opposite, subsessile, lance-oblong, 4 to 7 cm. long, 1.2 to 2 cm. broad, entire or obscurely serrate, revolute at the margin, acute at both ends, thickish, grayish green, scabrous-pubescent and strongly rugose above; veins much reticulated and prominulous beneath where covered by a dense spreading white pubescence; interstices covered by aureous particles: inflorescence of compound corymbs terminal upon the branches; bracts linear; heads rather small, 5 mm. in diameter, nodding on short glandular-puberulent pedicels, about 25-flowered; involucre scales unequal, pluriseriate, lance-linear, acute, pungent, green, striate, finely and sparingly pubescent; pales similar but narrower, rather rigid: corolla 3 mm. long, glabrous but covered with aureous particles; the proper tube greenish, about equalling the combined length of the whitish throat and lavender colored limb: achenes glabrous; pappus a short obscurely toothed cup. — Collected by C. G. Pringle on the Sierra de San Felipe, Oaxaca, Mexico, altitude 2,150 m., 5 October, 1894, no. 5675. Type in herb. Gray. Also secured in an immature state somewhat earlier (20 September, 1894) in the valley of Oaxaca by E. W. Nelson, no. 1446, and a little later (4 November, 1894) in the mountains of San Juan del Estado by Rev. L. C. Smith, no. 277.

***Ageratum stachyofolium*.** Erect perennial with long tough filiform white roots; stem 5 to 6 dm. tall, terete, finely striate, purplish, densely covered with fine crisped white hairs: leaves elliptical, sessile or nearly so, mostly alternate, crenate, obtuse, pubescent upon both surfaces, 3-nerved, deep green above, paler green and veiny beneath, 3 cm. long, half as broad: corymbs terminal, simple, regular, 7–10-headed; bractlets filiform-spatulate; pedicels 2 to 2.5 cm. long, canescent-tomentulose; heads large for the genus, 1.2 cm. in diameter, about 100-flowered; scales of the involucre linear, acute, strongly striate, hirsute: achenes glabrous, sharply angled, dark brown, somewhat tapering toward

the base, 2 mm. long; pappus a short scarious untoothed cup without awns. — Collected by E. W. Nelson in the vicinity of La Parada, Oaxaca, altitude 2,310 to 2,620 m., 19 August, 1894, no. 991. Types in herb. Gray and herb. U. S. Nat. Museum.

Eupatorium anisopodum. Herbaceous perennial: stems terete, decumbent, flexuous, irregularly branched, puberulent especially near the nodes and under a strong lens, green or purplish tinged, 3 to 5 dm. high: leaves ovate or rhombic-ovate, opposite, 2 to 2.5 cm. long, 1.2 to 1.7 cm. broad, thickish, not punctate, crenate-serrate from the broadest portion to the acutish apex, covered above with fine short curved hairs, slightly paler beneath and appressed-pubescent upon the veins, 3–5-nerved, subcuneate at the base to a short petiole (5 mm. in length): bracts ovate-lanceolate, acute, 3 to 7 mm. long, the lower petiolate the upper sessile; heads small, 25–30-flowered, 5 to 7 mm. in diameter, not numerous, irregularly corymbose on pedicels of very unequal length; scales of the turbinate-campanulate involucre pluriseriate, very unequal, the outer short, ovate, acuminate, herbaceous, pubescent; the inner oblong, acute, pale, 2–3-nerved, ciliolate, sparingly pubescent or glabrous: corolla 2.2 mm. long, probably white, glabrous except at the limb where under a strong lens puberulent, the proper tube short, considerably exceeded by the subcylindric scarcely ampliate throat: achenes columnar, at length black, hispidulous on and between the five nerve-like angles, 1.5 mm. long; pappus-bristles 15 to 20, bright white, about equalling the corolla. — *E. pycnocephalum*, Coult. in J. Donnell Smith, Enum. Pl. Guat. ii. 94 (1891), not Less. — Collected by H. von Türkheim at Santa Rosa, Department Baja Vera Paz, Guatemala, altitude 1,540 m., April, 1887, no. 1177 of Mr. J. Donnell Smith's Guatemalan set. Type in herb. Gray. While possessing something the habit of *E. pycnocephalum*, Less., this plant is readily distinguished by its very different pluriseriate involucre.

EUPATORIUM ARALIAEFOLIUM, Less. *Linnaea*, vi. 403 (1831). Add syn. *E. heterolepis*, Robinson, *Proc. Am. Acad.* xxxv. 335 (1900).

EUPATORIUM BIGELOVIL, Gray, *Bot. Mex. Bound.* 75 (1859). Add syn. *E. madrense*, Wats. *Proc. Am. Acad.* xxvi. 137 (1891).

EUPATORIUM CONSPICUUM, Kunth & Bouché, *Ind. Sem. Hort. Berol.* 1847, p. 13. Of this, *E. grandifolium*, Regel, *Gartenflora*, i. 102, t. 12 (1852), is certainly a synonym.

Eupatorium Coulteri. Stem slender, straight, terete, densely fuscous-puberulent: leaves opposite, deltoid-ovate, acute or subcaudate, somewhat hastate-lobed at the almost truncate base, shallowly dentate,

thin, harsh and slightly scabrous upon both surfaces, 4 to 5 cm. long, half as broad, minutely punctate, slightly pubescent upon the nerves; slender fuscous-pubescent petioles 1 cm. long: heads in rounded axillary and terminal thyrsoid panicles; pedicels filiform, flexuous, covered with fine spreading purple pubescence; bracts and bractlets subulate, minute; involucre turbinate, the lower much reduced scales somewhat decurrent upon the pedicels, the inner scales oblanceolate-oblong, acuminate, erose, puberulent or granular dorsally, thin, striate, often purplish-tinged; flowers about 8: corolla tubular, slightly and gradually narrowed from the summit to the base, essentially glabrous, slightly exceeding the barbellate pappus: achenes dark-colored, upwardly hispid upon the prominent angles. — *E. ageratifolium*, var. *purpureum*, Coulter, Bot. Gaz. xvi. 98 (1891). — Collected by H. von Türckheim in Coban, Depart. Alta Vera Paz, Guatemala, altitude 1,415 m., March, 1887, no. 52 of Mr. John Donnell Smith's sets. This plant differs from *E. ageratifolium*, DC., so greatly in pubescence, leaf-texture, involucre, and inflorescence that intergradation does not appear likely.

EUPATORIUM DASYCARPUM, Gray, Proc. Am. Acad. xxii. 420 (1886). Add syn. *Stevia rapunculoides*, DC. Prodr. v. 124 (1836).

Eupatorium dryophilum. Perennial from a thickish branched caudex; stems several, erect, 5 to 7 dm. high, terete, finely striate, puberulent or tomentulose, slightly scabrous, not glandular, reddish brown, branched at the summit: leaves opposite or ternate, sessile, ovate or oval, the lowest obtuse, the upper acute, all 3-nerved, shallowly few-toothed, thickish, reticulate-veiny, very scabrous upon both surfaces, entirely destitute of glands or resinous particles: heads large, 1.4 cm. in diameter, slender-pedicelled, erect; involucreal scales thin, green, oval to oblong, rounded at the apex, 4-5-seriate, striate, glabrous, mealy not viscid: corollas purple, glabrous except at the short-toothed limb: pappus-bristles sordid, barbellate, very unequal; achenes dark olive, 4 mm. long, granular. — Collected by Dr. Edward Palmer, on the Rio Blanco, Jalisco, October, 1886, no. 651, and by C. G. Pringle with oaks and pines on rocky hills near Guadalajara, nos. 2171, 2323. This species is near *E. pleianthum*, Robinson, but differs from it in the absence of resinous globules upon the leaves and the presence of mealiness upon the involucre which is not viscid, also in its shorter darker achenes with fine transverse striation.

EUPATORIUM HYSSOPINUM, Gray, Proc. Am. Acad. xv. 28 (1880). Add syn. *E. koelliaefolium*, Greene, Pittonia, iii. 31 (1896). Identity exact.

EUPATORIUM LEMMONI, Robinson, Proc. Am. Acad. xxvii. 171 (1892). Add syn. *E. euonymifolium*, Greene, Pittonia, iii. 31 (1896), founded upon a co-type.

Eupatorium Gonzalezii. Apparently herbaceous and to the unassisted vision glabrous throughout; stems terete, green, finely striate, lucid, purple at the nodes, slender; the younger parts microscopically puberulent: leaves opposite, long-petioled, deltoid-ovate, obtuse, coarsely crenate-dentate, 3-nerved from the entire abruptly acuminate base, thin, bright green and glabrous upon both surfaces, 4.5 to 7 cm. long, 4 to 4.5 cm. broad; petioles slender, 3 cm. long; the uppermost leaves ovate-lanceolate, entire, shorter-petioled: heads numerous, about 18-flowered, small, in compound axillary and terminal cymes; peduncles and pedicels ascending, obscurely puberulent; bracts spatulate and mucronate to linear and acute, small; involucre scales green, striate, narrow, linear, obtuse at the scarious erose and often crumpled apex, a few of the outer considerably shorter, ovate, acuminate, ciliolate: corollas white, glabrous throughout, the greenish white proper tube somewhat exceeded by the pure white throat and spreading limb: achene dark, 1.3 mm. long, upwardly hispid on the angles; pappus pure white, sparse; the bristles essentially equal, nearly as long as the corolla, slightly connate into a minute cup at the base. — Collected by Professors C. Conzatti and V. González at El Fortín, Oaxaca, altitude 1,600 m., March, 1897, no. 387.

Eupatorium leonense. Stem 4 mm. in diameter, slightly lignescent, pithy, yellowish brown, glabrate; branches opposite, curved-ascending, striate, tomentulose, finely pubescent: leaves opposite, ovate to deltoid-ovate, long-petioled, thin, coarsely and rather bluntly few-toothed, acutish, abruptly contracted at the entire base to an acuminate attachment to the long petiole, finely pubescent when young, nearly or quite glabrate at maturity, 3 to 5 cm. long, nearly as broad, 3-nerved from a little above the base; petioles 3 to 4 cm. long, pubescent: pedicels slender, flexuous, green, puberulent; bracts minute, subulate; heads rather few in a small round-topped panicle, medium-sized, 8 mm. long, about 12-flowered; involucre campanulate, loosely imbricated, lance-linear, attenuate, very acute, green, striate, thin, sparingly white-pubescent, the outer much shorter: corolla narrowly cylindrical, of essentially uniform diameter throughout its length and without clearly marked throat or proper tube, glabrous: style-branches strongly clavate, yellow; achenes black, glabrous, lucid, 2 mm. long with conspicuous yellow callosity at the base; pappus white, equalling the corolla. — Collected by

C. G. Pringle on the Sierra Madre near Monterey, Nuevo Leon, Mexico, 16 June, 1887, no. 2277.

Eupatorium Liebmannii, Sch. Bip. in Klatt, Leopoldina, xx. 75 (1884). From the characters given and from an excellent drawing (in herb. Klatt) prepared from the original material I cannot avoid the conclusion that this is identical with the earlier *E. hirsutum*, DC., the type of which I have recently examined in the Prodromus Herbarium. The species is represented by Mr. Pringle's no. 6046 from the foothills of the Sierra de San Felipe, Oaxaca.

Eupatorium longifolium. Suffrutescent, 1 m. high: stems virgate, terete, finely striate, covered by a fine spreading purplish and probably viscid pubescence: leaves opposite, short-petioled, ovate-lanceolate, crenate-serrate, 3-nerved, thin, dark green and strigillose (under a lens) above, paler and tomentulose especially upon the veins and veinlets beneath, 1 to 1.2 dm. long, 4 to 5 cm. broad, attenuate to a caudate apex, rounded and deeply cordate at the base, the sinus narrow: inflorescences rounded-corymbose, together forming a large leafy oval or subpyramidal panicle; its branchlets, slender pedicels, and filiform bracts brown-pubescent; heads very numerous, 4 to 5 mm. long, about 10-flowered; involucreal scales linear, attenuate, subequal, 3 mm. long, covered with jointed purple hairs and resinous lucid atoms: corolla scarcely 2 mm. long, gradually contracted toward the base, nearly equalled by the simple white pappus: achene dark, minutely pubescent, 1.5 mm. long. — Collected by C. G. Pringle in Tamasopo Cañon, San Luis Potosi, Mexico, 28 November, 1890, no. 3372. This number was distributed as *E. Palmeri*, Gray, to which it is obviously related. It differs, however, both in the nature of its indument and the form of the leaves. The latter are rounded at the base in *E. Palmeri* while in *E. longifolium* they are deeply cordate. *E. filicaule*, Sch. Bip., is also a nearly related species, but its heads are conspicuously racemose, which is not the case here.

EUPATORIUM LUCIDUM, Ort. Hort. Matr. Dec. 35 (1797). An examination of authentic material of this briefly characterized species shows that it is just the plant to which I have recently assigned the name *E. capnoresbium*, Proc. Am. Acad. xxxv. 331, a name which must accordingly sink into synonymy.

Eupatorium Luxii. Apparently shrubby: branches subterete, striate, covered with a fine spreading and very dark pubescence: leaves opposite, elliptic-ovate (the upper ovate-lanceolate), acute to acuminate at each end, pinnately nerved, 6 to 13 cm. long, half as broad, serrate,

sparingly pubescent when young, quite glabrate except on the nerves and somewhat lucid in age, nigrescent in drying, the teeth salient, mucronulate; petioles 1.8 to 3 cm. long; heads medium-sized, about 25-flowered, 8 to 10 mm. long, in an opposite-branched corymbose panicle; involucrel scales 3-4-seriate, ovate to lanceolate, acuminate, closely imbricated externally, nigrescent at the tip, pale at the base, ciliolate, silvery and lucid on the smooth inner surface: corolla-tube 5 to 6 mm. long, glabrous, gradually narrowed from the summit to the base, the teeth very short, sparingly pubescent: achenes 2 mm. long, dark, glabrous, lucid, the angles very prominent; pappus rather copious, white, nearly equalling the corolla. — Collected by Heyde and Lux at Nebaj, Depart. Quiché, Guatemala, altitude 2,150 m., April, 1892, being no. 3387 of Mr. John Donnell Smith's sets of Central American plants, and having been distributed as *E. Tuerckheimii*, Klatt, a species with much narrower leaves and linear-oblong involucrel scales, glabrous stem, etc., well shown by no. 77 of Mr. John Donnell Smith's sets.

Eupatorium lyratum, Coulter, Bot. Gaz. xvi. 96 (1891), is *Conyza lyrata*, HBK.

Eupatorium Mariarum. Herbaceous; stems terete, weak, pithy, obscurely pulverulent-puberulent and also covered with scattered spreading white trichomes; branches ascending: leaves opposite, long-petioled, deltoid, acute, coarsely crenate except at the abruptly contracted base, thin, deep green and bearing a few scattered white trichomes above, somewhat paler and essentially glabrous beneath, 3-nerved from the slightly acuminate point of attachment, 5 to 7 cm. long, 4 to 5 cm. broad; petioles weak, flexuous, 3 to 5 cm. long, with a double pubescence as on the stem: heads about 25-flowered, in small axillary and terminal corymbs, pedicellate; bractlets acute, lance-linear to filiform; involucrel scales linear-oblong, acute, subequal, thin, mostly 2-nerved, green, 3 mm. long: corolla (probably white) glabrous, with a slender proper tube exceeding a much broader well-marked throat and spreading limb: achenes dark-brown, slightly spindle-formed, hispidulous toward the summit. — Collected by E. W. Nelson on Maria Madre Island of the Tres Marias Group, May, 1897, no. 4244. At first taken for *E. pazcuarensis*, HBK., but clearly distinct by its long petioles, different leaf-contour and dentation, also in its pubescence.

Eupatorium pachypodum. Caudex thickish, lignescent, branched; stems annual, one to several, erect, simple to the inflorescence, 3 to 4 dm. high, terete, cinereous-tomentulose: leaves opposite, small, much exceeded by the internodes, ovate to suborbicular, acute, rounded at the

essentially sessile base, serrate, 1.3 to 1.8 cm. long, nearly as broad, green and sparingly pubescent above, covered beneath by a short soft ashy more or less deciduous pubescence, and bearing upon both surfaces golden resinous particles: panicle flat-topped, its slender ascending branches and pedicels (7 to 9 mm. long) grayish-tomentulose; bractlets linear to filiform; heads about 12-flowered, 7 mm. long; involucre scales subequal, oblong, soft-pubescent and pale green upon the outer surface, 3 to 4 mm. long, obtuse: corollas white or at least pale, 4 mm. long, with slender tube somewhat exceeded by the gradually amplified throat, glabrous: achenes 2 lines long, hispid on the angles, pappus white, equalling the corolla. — Collected by C. G. Pringle on rocky hills near Guadalajara, Jalisco, 26 May, 1891, no. 3718. Distributed as *E. scordonioides*? a species with shrubby perennial stems, deltoid-peltate leaves, etc.

Eupatorium pansamalense. Stem glabrous, rather strongly angled, striate, pithy: leaves opposite or ternate, slender-petioled, rhombic-ovate, caudate-acuminate, acute at the base, mucronate-serrate, thin, pinnately nerved, deep green and nearly glabrous except on the midnerve above, paler and puberulent or tomentulose upon the nerves and veins beneath, 1 to 1.3 dm. long, half as broad; petioles 2 to 3 cm. long: branches of the inflorescence and filiform pedicels fuscous-tomentulose; heads about 35-flowered, very numerous in a round corymbose panicle; scales of the involucre in about 3 series, narrowly oblong, acute to acutish, in a dried state stramineous except a central dark brown streak, the more or less narrowed tips thin, erose: corollas slender, without definitely marked throat, glabrous except near the limb: pappus white, equalling the corolla; achenes very small, scarcely 1.4 mm. long, glabrous. — *E. Tuerckheimii*, Coulter, Bot. Gaz. xvi. 97 and in J. D. Smith, Enum. Pl. Guat. ii. 95, as to no. 1342, not Klatt. — Collected by H. von Tuerckheim at Pansamalá, Depart. Alta Vera Paz, Guatemala, altitude 1,170 m., April, 1888, no. 1342 of Mr. John Donnell Smith's sets. *E. Tuerckheimii*, Klatt, differs in having much narrower oblong-lanceolate subcoriaceous short-petioled leaves which are quite glabrous upon both sides, paler beneath, and marked by a fine transverse venulation.

Eupatorium pinabetense. Shrub with angled and striate glabrous branches: leaves opposite, lance-oblong, acuminate at each end, mucronulate-serrate, smooth, green and glabrous upon both surfaces, 1 to 1.5 dm. long, 2 to 3 cm. broad, pinnately veined from a strong midnerve: smaller branches of the rather dense thyrsoid panicle fuscous-

tomentulose under a lens; heads numerous, crowded, small, about 10-flowered, short-pedicelled; scales of the involucre very few, unequal, elliptical, rounded at the apex, glabrous but erose-ciliolate, in a dried state brown: corolla glabrous or nearly so even at the limb, without clearly marked throat, equalled by the white pappus: achenes (young) pale, glabrous, 1.8 mm. long. — Collected by E. W. Nelson near Pinabete, Chiapas, Mexico, 8 February, 1896, no. 3785. This species is near but clearly distinct from *E. daleoides*, Hemsl. and *E. tepicanum*, Hemsl.

Eupatorium pleianthum. Doubtless perennial: stem slender, terete, scabrous-puberulent, finely striate, reddish brown, loosely few-branched above: leaves opposite, ovate, essentially sessile, thickish, reticulate-veiny, coarsely few-toothed, acute, cordate, 3-nerved, 2.5 to 3.5 cm. long, two-thirds as broad, slightly scabrous upon both surfaces, covered below by bright resinous globules: heads large, 2 cm. in diameter, slender-pedicelled, erect; involucre scales imbricated in 3 or 4 rows, oval to oblong, rounded at the apex, thin, glabrous and glutinous, striate, pale green, scarcely herbaceous: corollas 6 mm. long, gradually narrowed from the summit to the base, about equalled by the copious stiffish tawny pappus: styles very long and conspicuous, clavate; achenes 5 to 6 mm. in length tapering toward the base, reddish brown, covered with resinous globules, not transversely striate. — *E. adenospermum*, var. *pleianthum*, Gray, Proc. Am. Acad. xv. 26. — Collected by Dr. Berthold Seemann, Western Mexico. Type in herb. Gray. While sharing many characters with *E. adenospermum*, Sch. Bip., this plant differs so markedly in its opposite (not alternate), shorter, ovate not oblong leaves of differing dentation that intergradation seems very unlikely.

Eupatorium prionobium. Branches ascending, terete, green, striate, puberulent: leaves opposite, petiolate, deltoid, ovate to ovate-oblong, cordate with open sinus and hastate tendency, acutish to rounded at the apex, crenate or crenate-serrate, thickish, bright green but covered with short scattered white hairs upon both surfaces, scarcely paler beneath, 2 to 4 cm. long, 1.7 to 2.5 cm. broad; petiole puberulent, 6 mm. long, sulcate upon the upper side: heads small, about 20-flowered, in round-topped sessile cinereous-puberulent corymbs; pedicels 3 to 5 mm. long; bractlets subulate; involucre green, the scales lance-oblong, acute, subequal, loosely imbricated, 2.5 mm. long, scarcely half the length of the flowers: corolla in dried specimen white, 3 mm. long, with a relatively long throat narrowed into a shorter tube, glabrous, equalled by the bristles of the pappus; these somewhat unequal, barbellate, white

but the barbules upon the lower half tipped with deep purple or violet: achenes 1.8 mm. long, upwardly hispid on the angles. — Collected by E. W. Nelson on the Sierra Madre, State of Chihuahua, Mexico, 29 September, 1899, no. 6499. Type in herb. Gray and herb. U. S. Nat. Museum. Related to *E. ageratifolium*, DC., and *E. occidentale*, Hook.

Eupatorium prionophyllum. Tree; appearing glabrous to the unassisted vision, but covered upon the branchlets, petioles, veins of the leaves, and pedicels by traces of a short close fuscous tomentum; branches curved; cortex gray: leaves opposite, slender-petioled, broadly ovate, conspicuously acuminate, usually obtuse at the base, incisely and often somewhat doubly serrate-dentate nearly from the base to the apex, thin, green on both surfaces, pinnately veined, 7.5 to 9 cm. long, two-thirds as broad; the teeth acuminate, incurved; petioles 1 to 4 cm. long: heads 25–30-flowered, in terminal opposite-branched rounded at first thyrsoid at length more open panicles; bractlets filiform; scales of the involucre imbricated in about 3 series, the outer short and ovate, acute, mucronate with a glandular tip, the inner oblong, obtusish, all striate, fimbriate-ciliolate, externally stramineous becoming purplish or fuscous in age especially near the tip, silvery and lucid within: corolla glabrous, gradually narrowed from the summit to the base: pappus white, barbellate, moderately copious, nearly equalling the corolla: achenes at maturity dark brown, glabrous, lucid. — *E. ixicladon*, Klatt, Bull. Soc. Bot. Belg. xxxi. 190, not Benth. — Collected by Prof. H. Pittier on the banks of the river Poros, no. 1705 (type in herb. Gray) and near the Rancho Flores, no. 1900, Costa Rica. This species has no close affinity with *E. ixicladon*, Benth., a plant well shown by Mr. J. D. Smith's no. 7501.

EUPATORIUM QUADRANGULARE, DC. Prodr. v. 150 (1836). Of this, *E. thyrsoideum*, Moc., notwithstanding its supposed terete stems, is certainly a synonym. Nothing beyond the younger branchlets of *E. thyrsoideum* appears to be known, while even in the square-stemmed *E. quadrangulare* these younger branches are often subterete.

Eupatorium viscidipes. Stem slender, terete, dark-purple, minutely glandular and very viscid; branches opposite, spreading, curved upward: leaves opposite, deltoid-ovate, caudate-acuminate, crenate-serrate in the middle, 3-nerved from the obtuse or subtruncate base, 2.2 to 3.5 cm. long, 1.3 to 2.5 cm. broad, minutely puberulent above, slightly paler and punctate beneath with translucent dots; petioles 1.2 to 1.7 cm. long: heads rather numerous, small, 6 mm. in diameter, about 18-flowered, borne in a large loose corymbose leafy-bracted panicle; pedicels filiform, 3 to

13 mm. long, glandular and very viscid, covered with extraneous particles; involucre turbinate-campanulate; the scales very unequal, much imbricated, pluriseriate, the outer ovate-oblong, the inner oblong, subscarios, striate, all obtuse or rounded at the apex, glabrous or slightly glandular, viscid: corolla glabrous, white, 2.3 mm. long; the proper tube short, much exceeded by the scarcely enlarged cylindric throat: achenes nearly black, columar, hispidulous on and between the angles; pappus bright white, a little shorter than the corolla. — *E. pycnocephalum*, Coult. in J. Donnell Smith, Enum. Pl. Guat. iv. 75 (1895), as to no. 3397, not Less. — Collected by Heyde & Lux at Chicamán, Department Quiché, Guatemala, altitude 1,230 m., April, 1892, no. 3397 of Mr. J. Donnell Smith's Guatemalan sets. Type in herb. Gray. To be distinguished from *E. pycnocephalum*, Less. by its viscidness, quite different and much more imbricated involucre, etc., and from *E. anisopodum*, described above, by its viscidness, different leaf-form, rounded instead of acute or acuminate involucre scales, etc.

Brickellia amblyolepis. Stem large, fistulose, 2 to 2.5 m. high, glabrous, purple mottled with green: leaves whorled below, opposite above, alternate in the upper parts of the open inflorescence, ovate, acuminate, 3-ribbed from the cuneate entire base, coarsely serrate from below the middle to the acuminate apex, green and glabrous above, paler and finely pubescent upon the veins beneath, 7 to 13 cm. long, half as broad; petioles 1.3 to 3.4 cm. long: heads rather large, broader than high, nodding in an open leafy panicle; pedicels bearing a few linear to spatulate bractlets; scales of the involucre in 3 to 4 series, spatulate-oblong, rounded at the apex, green and nearly glabrous except upon the deep purple tomentulose margin: corollas greenish, 5 mm. long, glabrous, nearly equalled by the rather copious purple-tinged pappus: achenes (immature) 5 mm. long, minutely pubescent; styles strongly clavate, bright orange turning to brown. — Collected by C. G. Pringle on mountains above Iguala, Guerrero, Mexico, 4 October, 1900, no. 8415. A stately species 2 to 3 metres high, not very closely related to any hitherto described. Type in herb. Gray.

Brickellia cardiophylla. Herbaceous; stem terete, glandular-pubescent; branches opposite, widely spreading: leaves ovate-triangular, acute or obtusish, entire or nearly so, broadly cordate at the base, membranaceous, 3-nerved, minutely glandular-puberulent, green upon both surfaces, scarcely paler beneath, 5 to 6 cm. long, nearly as broad; petioles slender, 2 to 3 cm. long: heads subumbellate near the ends of the branches, campanulate, 1 to 1.5 cm. in diameter; pedicels filiform, gland-

ular-puberulent, 2 to 3 cm. long, naked or bearing a single minute lanceolate bract; involucre scales appressed, imbricated in about 5 series, from ovate to linear obtusish, striate, the outer herbaceous-tipped, the inner often purplish; achenes columnar, 2.5 mm. long, minutely roughened or hispid; pappus bright white, not copious, 7 mm. in length: corollas in a dried state cream-colored. — Collected by C. G. Pringle in a barranca near Guadalajara, Jalisco, 1 May, 1894, no. 5885a. Type in herb. Gray. Near *B. floribunda*, Gray, but heads fewer and considerably larger: leaves subentire and of different contour.

Brickellia hebecarpoides. Erect herb, seemingly perennial but root not seen; stem straight, terete, striate, glandular-pubescent, copiously branched above: leaves opposite (the upper with a slight tendency to be alternate), ovate to ovate-oblong, acute or obtuse, membranaceous, finely and regularly serrate (the rameal entire or nearly so), rounded or abruptly acuminate at the 3–5-nerved often oblique base to the slender petiole, puberulent above, glandular-puberulent beneath, both surfaces green, the lower scarcely paler; branches slender, spreading, leafy: peduncles solitary in or usually a little above the forks of the branches, 1 to 2.5 cm. long, filiform, ascending or erect, glandular-pubescent, bractless; involucre 1.2 cm. long, campanulate, its outer bracts lance-oblong, acute, glandular-puberulent, herbaceous or at least herbaceous-tipped, half to two thirds the length of the lance-linear attenuate striate often purplish inner bracts; flowers about 30: corolla 1.3 cm. long, slender, glabrous, purple-tinged at least near the limb: achenes short, only 2 mm. in length, minutely pubescent; style-branches orange, strongly clavate. — Collected by C. G. Pringle in a barranca near Cuernavaca, State of Morelos, Mexico, altitude 1,540 m., 24 June, 1896, no. 7332. Type in herb. Gray. This species is related to *B. hebecarpa*, Gray, but differs in its scarcely pubescent achenes and much longer outer involucre scales, as well as in other ways.

Brickellia petrophila. Compact shrub, 3 to 6 dm. high; stems branched from near the base; branches curved-ascending, becoming erect, gray or lightish brown, covered with a fine spreading pubescence consisting of minute gland-tipped hairs and longer non-glandular hairs, the latter readily distinguishable to the unassisted vision: leaves opposite, small, reniform, ovate, crenate, obtuse, broadly and shallowly cordate at the base, 7 to 10 (rarely 28) mm. long, 1 to 3 cm. broad, somewhat rugose above, finely pubescent or even tomentulose upon both surfaces, but scarcely or not at all canescent: heads subsessile, terminal on short or more elongated branchlets either forming a cylindric racemiform or a

broadier and more pyramidal inflorescence, the two forms occurring upon the same individual; involucre cylindric or in a dried state narrowly campanulate, the scales stramineous, striate, imbricated in about four very unequal series, the outer ovate, obtuse, pubescent or at least ciliate, the inner oblong-linear, acute, about 8 mm. long; flowers about 20: achenes columnar, 3 mm. long, olive brown, slightly hispid on the ribs. — Collected by C. G. Pringle on rocky hills near the city of Chihuahua, 13 October, 1885, no. 610 (type, in herb. Gray). To this species I would refer the following specimens: from San Luis Potosi, *Schaffner*, no. 365, *Parry & Palmer*, no. 351; from Guanajuato, *Dugès*, no. 449; from Zacatecas, *Deam*, no. 140; from Durango, *Palmer*, no. 753. This species is nearly related to and has been generally confused with the more southern *B. veronicaefolia*, Gray, a species which is readily distinguishable by the extremely fine canescent non-glandular pubescence of its branchlets, in which the individual hairs cannot be seen without the use of a strong lens. The involucral scales of *B. veronicaefolia* are more closely imbricated and in more numerous rows.

Var. *umbratilis*. Heads larger, 1.5 cm. in diameter, terminal upon more elongated branches. — Collected by Dr. Edward Palmer in a shady ravine at Parras, Coahuila, October, 1898, no. 438, and also a solitary individual in a ravine at Mapimi, Durango, no. 521.

Brickellia vernicosa. Shrub with striate buff or at length gray cortex and erect scabrous-puberulent branches: leaves alternate, ovate, serrate, acutish, bright green, coriaceous, veiny, subsessile, minutely hispidulous, glandular-punctate beneath, often vernicose, 1 to 1.7 cm. long: inflorescences cylindric thyrses 1 to 1.5 dm. long; bracts leaf-like but very small; heads subsessile, 1.2 cm. long, on short branches; involucral scales about 4-seriate, varying from ovate to linear-oblong, obtuse, minutely granular, striate: slender corollas 7 to 8 mm. long, the upper half violet: achenes slender, columnar, light-colored, 4 mm. long, upwardly hispid; pappus copious, 6 mm. long; styles yellow, only moderately clavate. — Collected by Dr. Edward Palmer at Santiago Papasquiaro, Durango, "April and August," 1896, no. 57. Related to *B. baccharidea*, Gray, but readily distinguished by its much longer achenes, etc.

MONTANOA ARBORESCENS, Sch. Bip. (*Montagnaea arborescens*, DC. Prodr. v. 565). An examination of the type shows that the tips of the pales are recurved as in most of the other species of this genus and not inflexed as unfortunately described in the original characterization. The leaves are oblong-lanceolate, attenuate at each end, rather sharply

and regularly serrate near the middle and relatively narrower than in the nearly related *M. frutescens*, Hemsl. I am unable to find *M. arborescens* represented in any of the many recent Mexican collections.

Calea Pringlei. Stems terete, 6 to 9 dm. high, in dried state striate, dull brown, covered with a fine spreading or slightly reflexed tomentum of sordid color, and on young parts somewhat glandular; branches opposite: leaves broadly ovate to nearly orbicular, sessile, acute, coarsely dentate (1 to 1½ teeth to the centimeter), rugose and scabrous-puberulent above, paler green, reticulate veiny, and covered with a fine white crisped pubescence beneath: heads 8 mm. long, 3 mm. in diameter, about 10-flowered, borne on pedicels 2 to 5 mm. long in opposite-branched compound umbelliform cymes; scales of the cylindrical involucre pale yellow, striate, very unequal, rounded at the tip, the outer sparingly pubescent, small, not foliaceous nor even herbaceous; pales erose, nearly or quite glabrous: corolla nearly glabrous but covered with transparent globules, the proper tube slender and somewhat contracted to the summit where it suddenly expands into the very short throat and deeply cleft limb of five linear segments: achenes slender, somewhat attenuate toward the base, dark-colored with a violet tinge, appressed-pubescent; pappus scales about 1 mm. long, also purple-tinged. — Collected by C. G. Pringle on mountains above Iguala, Guerrero, Mexico, altitude 1,230 m., 24 October, 1900, no. 8373. Type in herb. Gray.

CALEA ZACATECHICHI, Schlecht., var. *calyculata*. Involucre subtended at the base by 2 or 3 herbaceous-tipped bracts; these usually shorter than but sometimes exceeding the inner scarious scales. — Mexico, Nuevo Leon in the Sierra Madre near Monterey, *C. G. Pringle*, no. 2224, 16 July, 1888; also in the same locality, *C. & E. Seler*, no. 1080, 12 October, 1895.